

We Claim:

Claims

1. A method of making a ceramic shell mold, comprising repeatedly coating a fugitive pattern of an article to be cast with a ceramic slurry layer and applying on the ceramic slurry layer a refractory stucco to form a plurality of ceramic slurry layers and stucco layers on the pattern wherein at least one of the stucco layers is formed at least in part by applying bundles of discontinuous stucco fibers held together in the bundle by a fugitive binder on a ceramic slurry layer.
2. The method of claim 1 including the further step of applying a granular stucco particles on the bundles of the discontinuous stucco fiber bundles.
3. The method of claim 2 wherein the granular stucco particles are applied on randomly oriented discontinuous stucco fiber bundles to pack the discontinuous stucco fiber bundles down on the slurry layer underlying the discontinuous fibers.
4. The method of claim 3 wherein the granular stucco particles are applied on the randomly oriented discontinuous stucco fiber bundles while the underlying slurry layer is still wet such that a majority of the packed down discontinuous stucco fiber bundles stick to the slurry layer.

5. The method of claim 3 wherein the granular stucco particles are applied on the randomly oriented discontinuous stucco fiber bundles to form a stucco layer comprising packed down discontinuous stucco fiber bundles and the granular stucco.

6. The method of claim 5 wherein some of the granular stucco particles fill spaces between the packed down discontinuous stucco fiber bundles.

7. The method of claim 1 wherein the granular stucco particles are applied by raining the granular stucco particles by gravity down on the discontinuous stucco fiber bundles.

8. The method of claim 6 wherein the discontinuous stucco fiber bundles and the granular stucco particles comprise the same or different ceramic material.

9. The method of claim 1 including the further step of firing the shell mold at an elevated temperature to remove the fugitive binder, leaving spaces between the stucco fibers to reduce compressive strength of the shell mold.

10. In a directional solidification casting process to make a single crystal casting, the improvement comprising casting a molten metallic material in a ceramic shell mold made pursuant to claim 9 to reduce occurrence of recrystallization in the single crystal casting.

11. The method of claim 10 wherein the metallic material comprises a nickel base superalloy or a cobalt base superalloy.

12. A ceramic shell mold, comprising a plurality of ceramic flour layers and refractory stucco layers wherein at least one of the stucco layers comprises discontinuous stucco fiber bundles and granular stucco particles.

13. The shell mold of claim 12 wherein said at least one of the stucco layers comprises packed down discontinuous stucco bundles with the granular particles on and between the fiber bundles.

14. The shell mold of claim 12 wherein the discontinuous stucco fiber bundles and the granular stucco particles comprise the same or different ceramic material.